U. S. FOREST SERVICE

RESEARCH NOTE NC-71

NORTH CENTRAL FOREST EXPERIMENT STATION, FOREST SERVICE—U.S. DEPARTMENT OF AGRICULTURE

Folwell Avenue, St. Paul, Minnesota 55101

Do Pine Gall Weevils Affect Cone Production in Red Pine?

ABSTRACT. — Red pine branchlets with and without weevil galls did not differ significantly in production of conelets.

OXFORD: 416.13—145.719.91 *Podapion gallicola*: **181.522:174.7** *Pinus resinosa*

The pine gall weevil (*Podapion gallicola* Riley) causes galls to develop on the branches of several species of pine. In north-central United States, red pine (*Pinus resinosa* Aiton) is its most common host. Female beetles lay eggs in a cavity in the bark of young branchlets in early summer, and 12 to 15 months later a gall of hypertrophied xylem tissue begins to form. The galls continue to enlarge even after the beetles have emerged as adults about 3 years after oviposition.[1] Conceivably, either the galls or the insects could upset the biochemical processes of a branchlet during the period of flower bud initiation and hence influence the number of pistillate flowers that form in the buds. The study reported here was designed to find out.

[1] *Wilson, L. F. Life history and some habits of the pine gall weevil,* Podapion gallicola *Riley, in Michigan. Can. Entomol. 97: 962-969. 1965.*

Methods

In brief, the procedure was to (1) measure branchlets and classify them according to the numbers and kinds of weevil galls present, (2) count conelets borne on the branchlets, and (3) compare numbers of conelets on branchlets with and without galls.

Galls with weevil larvae in them were classified as active galls, and those lacking larvae were classified as abandoned galls. The number of galls with and without insects was considered important in the experiment because insects might excrete substances that influence flower initiation. Galls were classified at time of sampling even though some abandoned galls may have been active when flower primordia were formed 12 to 13 months before. So the classification may have a slight bias.

The study was done in September 1968 in a 65- to 70-year-old red pine stand in Bayfield County, Wisconsin. Twenty trees with well developed midcrowns were randomly selected, and in each tree two midcrown branches were randomly selected from the west quadrant. All branchlets except those on the basal one-fourth of each branch were used. Basal branchlets were disregarded to reduce variability in branchlet lengths and conelet numbers.

Results and Discussion

Thirty percent of all branchlets and 50 percent of all conelet-bearing branchlets were galled. Seventy percent of the galled branchlets were longer than 20 inches; only 16 percent of the ungalled branchlets were this long. Moreover, as would be expected, conelet production increased with branchlet length (fig. 1), so only galled and ungalled branchlets of similar size were compared.

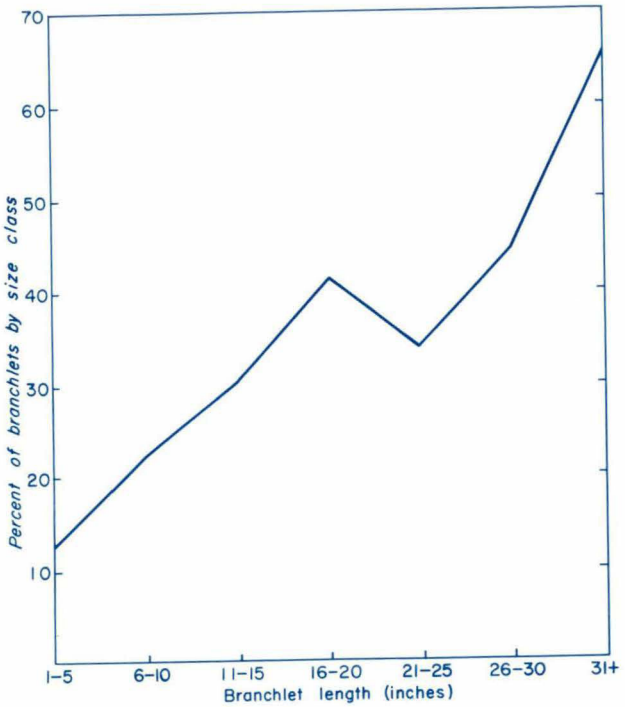

FIGURE 1. — Percent of branchlets bearing two or more conelets by branchlet sizes.

Data from the 20 trees were first analyzed to find out if there were differences in average conelet production between galled and ungalled branchlets, and between branches within trees and among trees. Differences, if any, were minor, so data from all branches and trees were pooled. This permitted a more detailed, specific test for differences in conelet production with different numbers of active and abandoned galls (table 1). There

Table 1. — Number of conelets on branchlets with different numbers of active and abandoned galls

Number of galls		Sum of conelets on 8 branchlets
Active	Abandoned	
0	0	19
0	1	9
0	2	26
1	0	10
1	1	18
1	2	16
2	0	22
2	1	17
2	2	13

were no significant differences in conelet production on branchlets having either active or abandoned galls. Similar studies in a 70-year-old red pine stand in Cass County, Minnesota, gave identical results.

The findings indicate that, on red pine, weevil galls have little or no influence on a branchlet's capacity to produce cones. These findings will probably also apply to other species of pine that are similarly infested with pine gall weevils. So unless galls interfere with branchlet strength or longevity, managers of pine seed orchards and seed-production areas need not be concerned about gall weevil infestations.

WILLIAM J. MATTSON
Associate Insect Ecologist

1969